

### In the Claims

Claim 1 (currently amended): A process for the simultaneous production of xylitol and ethanol from a hydrolyzed lignocellulose-containing material, comprising

providing a starting material of ~~the~~ hydrolyzed lignocellulose-containing material, ~~comprising xylose and hexose; said hexose comprising glucose, having a ratio of glucose/xylose, wherein the ratio of glucose/xylose is between about .25 to about 8, and glucose content is greater than about 10% of carbohydrates in the starting material;~~

8 fermenting said starting material with a yeast strain which is capable of converting  
10 free-xylose to xylitol and free-hexose<sup>glucose</sup> present to ethanol to form a fermented-product  
11 comprising xylitol, ethanol and yeast, wherein during fermentation over about 50% of the  
xylose in the starting material is converted to xylitol and ~~over about 40%~~ at least a  
portion of the glucose in the starting material is converted to ethanol;

recovering the resulting ethanol by distillation; and

recovering xylitol by chromatographic separation ~~from a bottom product of~~  
distillation.

I<sup>2</sup>  
Claim 2 (cancelled)

Claim 3 (previously amended): The process according to Claim 1, wherein  
said lignocellulose-containing material <sup>hydrolyzed</sup> is birch or grain hulls.

Claim 4 (cancelled)

Claim 5 (previously amended): The process according to Claim 1, further  
comprising crystallizing pure xylitol.

Claim 6 (previously amended): The process according to Claim 1, ~~10~~ 1,  
wherein ~~the~~ yeast cells are removed prior or subsequent to the distillation.

Claim 7 (previously amended): The process according to Claim 1 wherein the yeast strain is of the genus *Candida* or *Debaryomyces*.

Claim 8 (currently amended): The process according to Claim 1-~~or~~ 7, wherein the yeast is a ~~*Candida tropicalis* species~~ *Candida tropicalis* ATCC 9968.

Claim 9 (previously amended): The process according to Claim 1, wherein the yeast is of the species *Debaryomyces hansenii*.

Claim 10 (cancelled)

Claim 11 (previously amended): The process according to Claim 1, wherein ~~hydrolysis is carried out~~ the hydrolyzed lignocellulose-containing material is <sup>produced by</sup> hydrolyzed by steam explosion and enzymatic hydrolysis <sup>residue</sup>.

Claim 12 (previously amended): The process according to Claim 1, wherein the chromatographic separation is carried out with a strong cation-exchanging resin as a stationary phase.

Claim 13 (currently amended): The process according to Claim 1 wherein the fermentation is carried out at a pH of about 4 - 7, ~~and at a temperature of about 10-45°C.~~

Claim 14 (Cancelled)

Claim 15 (previously added): The process according to claim 8, wherein the yeast is *Candida tropicalis* ATCC 9968.

Claim 16 (previously added): The process according to Claim 13, wherein the fermentation is carried out at a pH of about 5.7 and at a temperature of about 25 - 35°C.

Claims 17-18 (Cancelled)

Claim 19 (currently amended): ~~the hydrolyzed lignocellulose-containing material~~ <sup>as a</sup> The process according to claim 1, wherein hydrolysis is carried out by the process selected from the group consisting of acid hydrolysis, enzymatic hydrolysis or combinations thereof.

Claim 20 (previously amended): The process according to claim 19, wherein hydrolysis is carried out by acid hydrolysis.

Claim 21 (previously amended): The process according to Claim 1 wherein the lignocellulose-containing material is treated by steam explosion followed by hydrolysis.

Claim 22 (Cancelled)

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Claim 23. (currently amended): A process for the simultaneous production of xylitol and ethanol from a hydrolyzed lignocellulose-containing material, wherein the lignocellulose-containing material <sup>hydrolyzed</sup> is selected from the group consisting of softwood, birch, beech, poplar, alder, plants, plant constituents, straw, hulls of wheat, corn, oat, barley, corn cobs, corn stems, nutshells, bagasse, cottonseed bran, wood chips, sawdust, sulphite spent liquor from woodpulp processing, waste from paper processing, and waste from woodpulp processing, comprising:

ab providing a starting material of the hydrolyzed lignocellulose-containing material comprising xylose and hexose, said hexose comprising glucose, having a ratio of glucose/xylose, wherein the ratio of glucose/xylose is between about .25 to about 8 and wherein glucose content is greater than about 10% of carbohydrates in the starting material;

4 fermenting said starting material to produce a fermented solution with a yeast capable of converting free xylose present in the starting material to xylitol and free hexose <sup>above</sup> present in the starting material to ethanol, said yeast selected from the group consisting of a yeast of the genera *Candida*, *Pichia*, *Pachysolen*, and *Debaryomyces*, said

fermenting comprising reducing said ~~free~~-xylose to xylitol and reducing said ~~hexose~~  
16 glucose to ethanol, and said fermented solution comprising xylitol, ethanol, and spent  
yeast; wherein during fermentation over about 50% of the xylose in the starting material  
20 is converted to xylitol and ~~over about 40% of a portion of~~ the glucose in the starting  
material is converted to ethanol;

separating a substantial portion of said spent yeast from said fermented  
solution to produce a substantially clarified solution comprising ethanol and xylitol, said  
clarified solution comprising substantially less spent yeast by weight on a dry solids  
(substance) basis than said spent yeast in said fermented solution, and said separating  
comprising at least one separating method selected from group consisting of filtration,  
centrifugation and decanting;

recovering ethanol by distillation;

recovering xylitol by chromatographic separation; and

crystallizing said xylitol to produce xylitol crystals.

I<sup>2</sup>  
Claim 24 (previously amended): A method according to Claim 23  
wherein hydrolysis <sup>to produce the hydrolyzed</sup> comprises at least one of the following: i) prehydrolysis of said  
lignocellulose-containing material by steam explosion of said lignocellulose-  
containing material and enzymatic hydrolysis of said lignocellulose-containing  
material with enzymes having a cellulolytic and xylanolytic activity to hydrolyze said  
lignocellulose-containing material; and ii) acid hydrolysis of said lignocellulose-  
containing material.

Claim 25 (previously added): A method according to Claim 23  
including removing solids comprising lignin from said <sup>fermented</sup> solution.

Claim 26 (currently amended): A method according to Claim 23 wherein  
said yeast is selected from the group consisting of genera *Candida tropicalis* ~~strain~~  
~~having an accession number ATCC 9968~~, strain having an accession number ATCC  
9968, and *Debaryomyces hansenii*.

Claim 27 (previously added): A method according to Claim 23 wherein fermenting occurs at a temperature ranging from about 10 to about 45 degrees C, at a pH ranging from 4 to 7 with a yeast concentration of about 1 to about 20 g of dry yeast per liter of solution having a xylose content of about 50 to about 300 g/l for about 24 to about 72 hours in the presence of nutrients.

Claim 28 (currently amended): A method according to Claim 23 wherein said ~~crystallization~~ crystallizing is selected from the group consisting of cooling ~~crystallization~~ crystallizing and evaporation ~~crystallization~~ crystallizing.

Claim 29 (previously added): A method according to Claim 23 wherein said xylitol crystals are separated by centrifugation and washed with water to produce substantially pure crystalline xylitol.

Claim 30 (previously amended): A method according to Claim 23 wherein:  
said hexose in said xylose-containing <sup>stationary material</sup> solution further comprises arabinose.

Claim 31 (currently amended): A process for the simultaneous production of xylitol and ethanol from a starting material of <sup>hydrolyzed</sup> lignocellulose-containing material comprising xylose, comprising the steps of:

partially hydrolyzing said lignocellulose-containing material by steam explosions and ~~subjecting said material to extraction~~ to produce a prehydrolysate, <sup>wherein glucose</sup> wherein fermenting a portion of the prehydrolysate obtained from the extraction is fermented to convert at least a portion of the xylose to xylitol; ~~which is separated chromatographically separating and crystallized;~~ ~~wherein a final hydrolysis is carried out on the extracted material resulting in crystallizing said xylitol;~~ further hydrolyzing another portion of the prehydrolysate to produce a hydrolysis product having a ratio of glucose/xylose, wherein the ratio of glucose/xylose is between about .25 to about 8 and wherein glucose content is greater than about 10% of carbohydrates in the starting material comprising xylose and

14 hexose, said hexose comprising glucose; fermenting the hydrolysis product ~~being~~  
~~fermented~~ to convert <sup>xylose</sup> hexoses to ethanol, followed by recovery of the ethanol by  
16 distillation; wherein during fermentation over about 50% of the xylose in the hydrolysis  
product is converted to xylitol and ~~over about 40%~~ a substantial portion of the glucose  
in the hydrolysis product is converted to ethanol.

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Claim 32 (withdrawn)

Claim 33 (withdrawn)

Claim 34 (withdrawn)

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